L27 ANSWER 5 OF 25 HCAPLUS COPYRIGHT 2004 ACS on STN
AN 1999:165487 HCAPLUS
TI Low cost/high volume laser modules using silicon optical bench technology
AU Osenbach, J. W.; Dautartas, M. F.; Pitman, E.; Nijander, C.; Brady, M.; Schlenker, R. K.; Butrie, T.; Scrak, S. P.; Auker, B. S.; Kern, D.; Salko, S.; Rinaudo, D.; Whitcraft, C.; Dormer, J. F.
SO Proceedings - Electronic Components & Technology Conference (1998), 48th,581-587
CODEN: PETCES

AB A review with 8 refs. As the information age continues to expand, there is a considerable need for low cost/ high volume, reliable **optoelectronic** modules. Because of the potential cost savings, Si optical bench technol. (SiOB) has emerged as one of the leading enabling technol. candidates needed for the com. realization of such modules. As a result, over the past 3 to 5 yr, there was a significant number of papers published on the use of SiOB for low cost **optoelectronic** modules. The authors report on the use of SiOB technol. used in the production of low cost/high volume, reliable laser modules. The SiOB platform is designed for manufacturability, reduced parts count, reduced process steps, and **ability** to accept design changes to respond to a rapidly changing marketplace. For example, this SiOB technol. was used for at least 4 different laser designs/types without significant changes in the SiOB manufacturing, optical subassembly, or package assembly process. The SiOB technol. is the 1st of its kind in that it integrates: (i) Si micromachining for the **lens** holder cavities and back face monitor turning mirror, (ii) Ti/Pt/Au for interconnect metalization and **photodiode bonding**, (iii) Al for AlO **bonding attachment** of the **lens**, and (iv) Au/Sn solder for laser **attachment**. The laser and **photodiode** are passively aligned using a visual alignment system and fiducials on the Si. The **lens** is self-aligned to the Si during the AlO **bonding** process. Because the authors use AlO **bonding** for **lens attachment** and solder **bonding** for laser and **photodiode attachment**, this optical subassembly (OSA) contains no organic materials. Following the discussion on the OSA assembly technol., the authors discuss the assembly technol. used to produce low cost uncooled laser modules and the performance of these modules. As was the case for OSA assembly, no organic **adhesives** are used in the hermetic enclosure of the laser module assembly. Finally, the authors present the reliability data for the module. The reliability data indicate that the optical alignment of these modules is extremely stable. The authors observe essentially no change in optical coupling as a result of extended storage at 85C, extended temperature cycling between -40C and +85C, or extended storage at 40C/95%RH. To knowledge, this is the 1st high volume/low cost, highly reliable edge emitting laser module that extensively uses SiOB technol. and design for manufacture principles.

IT **Adhesives**
Electronic packages
Lenses
Micromachining
Optoelectronics
Photodiodes
Semiconductor lasers
(low cost/high volume laser modules using silicon optical bench technol.)

IT 7429-90-5, Aluminum, uses 7440-06-4, Platinum, uses **7440-21-3**, Silicon, uses **7440-31-5**, Tin, uses 7440-32-6, Titanium, uses 7440-57-5, Gold, uses
RL: DEV (Device component use); USES (Uses)
(low cost/high volume laser modules using silicon optical bench technol.)

IT **7440-21-3**, Silicon, uses **7440-31-5**, Tin, uses
RL: DEV (Device component use); USES (Uses)
(low cost/high volume laser modules using silicon optical bench technol.)

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     (FILE 'REGISTRY' ENTERED AT 12:18:45 ON 11 MAR 2004)
L1              QUE  A3/PG(L)A5/PG NOT (C OR H)/ELS
L2              QUE  (A1 OR A2 OR A4 OR A6 OR A7 OR A8)/PG
L3              QUE  (B3 OR B4 OR B5 OR B6 OR B7 OR B8 OR B1 OR B2)/PG
L4         9931 SEA  L1 NOT (L2 OR L3)
L5              QUE  B2/PG(L)A6/PG NOT (C OR H)/ELS
L6              QUE  (A1 OR A3 OR A4 OR A5 OR A7 OR A8)/PG
L7              QUE  (B3 OR B4 OR B5 OR B6 OR B7 OR B8 OR B1 OR B3)/PG
L8         4251 SEA  L5 NOT (L6 OR L7)
L9              QUE  (A4/PG OR C/ELS) NOT H/ELS
L10             QUE  (A1 OR A2 OR A3 OR A5 OR A6 OR A7 OR A8)/PG
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L12       11705 SEA  L9 NOT (L10 OR L11)

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     FILE 'HCAPLUS, INSPEC, WPIX' ENTERED AT 12:29:53 ON 11 MAR 2004
L13     3573837 SEA  (EFFIC####### OR ABILIT### OR OPTIM?)
L14      414679 SEA  HEMI? OR FRENEL? OR FRESNEL? OR ELLIPSOID? OR LENS##
L15      896027 SEA  LED# OR L(W)E(W)D OR LIGHT(W)(EMITT? OR
                EMISSI?) OR LUMINES? OR EL OR ELD OR ELD OR ELECTROLUMIN? OR
                ELECTROPHOSPHOR? OR PHOSPHORES? OR SUPERLUMIN? OR OPTOELECT?
                OR OPTO(W)ELECT? OR ELECTROOPTIC? OR PHOTODIODE? OR (PHOTO OR
                OPTIC OR OPTO)(W)DIODE
L16     1535827 SEA  ?GLASS? OR ?SILICATE? OR SAPPHIRE#
L17     7004739 SEA  BOND? OR GLUE? OR GLUING OR ADHE########
                OR ATTACH? OR FASTEN? OR AFFIX? OR CONNECT? OR JOIN? OR LINK?
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     FILE 'HCAPLUS, INSPEC, WPIX' ENTERED AT 12:36:43 ON 11 MAR 2004
L18      323500 SEA  (H01L051? OR H01L033? OR H05B033 OR
                G02F001? OR G09F009? OR H01S003?)/IC
L19     1143320 SEA  L18 OR L15

     FILE 'HCAPLUS' ENTERED AT 12:38:39 ON 11 MAR 2004

L20             QUE  L4 OR L8 OR L12
L21         175 SEA  (L20 OR L16)AND L13 AND L14 AND L17
L22          31 SEA  L21 AND L15
L23           8 SEA  L21 AND L18
L24          34 SEA  (L22 OR L23)
L25          21 SEA  L24 NOT P/DT NOT PY>2000
L26           4 SEA  L24 AND P/DT NOT PRD>20000912
L27          25 SEA  (L25 OR L26)
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L27 ANSWER 9 OF 25 HCAPLUS COPYRIGHT 2004 ACS on STN
AN 1998:53064 HCAPLUS
TI Prospects of highly **efficient** AlGaInP based surface emitting type ring-**LED** for 50 and 156 Mb/s POF data **link** systems
AU Dutta, Achyut Kumar
SO Journal of Lightwave Technology (1998), 16(1), 106-113
CODEN: JLTEDG; ISSN: 0733-8724
AB The detail design and performance of the surface emitting type visible **light emitting** diode (**LED**) is described for using in the plastic optical fiber (POF)-based data **links**. The diode showed brightness ≤3.5 mW @ 100 mA (d.c.) and also exhibited the beam divergence angle ≥10° with using of well designed plastic **lens**. The using of **LED** with plastic **lens** helps to attain also the coupling **efficiency** over 70% with POF. The temperature rise of the ring **LED** under operation also is 9 and 6° less than the conventional diode at 50 and 35 mA bias currents, resp. Transmission expts. reveal that the diode is suitable for 50 and 156 Mb/s 100 m POF-based data **links**.
IT **Electroluminescent** devices
(surface emitting; prospects of highly **efficient** AlGaInP based surface emitting type ring-**LED** for POF data **link** systems)
IT **1303-00-0**, Gallium arsenide, uses **37382-15-3**, Aluminum gallium arsenide ((Al,Ga)As) **163207-18-9**, Aluminum gallium indium phosphide
RL: DEV (Device component use); USES (Uses)
(prospects of highly **efficient** AlGaInP based surface emitting type ring-**LED** for POF data **link** systems)
IT **1303-00-0**, Gallium arsenide, uses **37382-15-3**, Aluminum gallium arsenide ((Al,Ga)As) **163207-18-9**, Aluminum gallium indium phosphide
RL: DEV (Device component use); USES (Uses)
(prospects of highly **efficient** AlGaInP based surface emitting type ring-**LED** for POF data **link** systems)
RN 37382-15-3 HCAPLUS
CN Aluminum gallium arsenide ((Al,Ga)As) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
Ga	0 - 1	7440-55-3
As	1	7440-38-2
Al	0 - 1	7429-90-5

RN 163207-18-9 HCAPLUS
CN Aluminum gallium indium phosphide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
P	x	7723-14-0
In	x	7440-74-6
Ga	x	7440-55-3
Al	x	7429-90-5

L27 ANSWER 12 OF 25 HCAPLUS COPYRIGHT 2004 ACS on STN
AN 1997:314037 HCAPLUS
TI Wideband four channel optical transmitter package using vertical cavity surface emitting laser arrays
AU Corazza, D. J.; Rajkumar, N.; Keyworth, B. P.; Mcmullin, J. N.; Macdonald,R. I.
SO Proceedings of SPIE-The International Society for Optical Engineering (1997), 3005(Optoelectronic Interconnects and Packaging IV), 354-359
CODEN: PSISDG; ISSN: 0277-786X

AB The authors report on the fabrication of a prototype multichannel optical transmitter based on vertical-cavity surface-emitting lasers (VCSELs). The package consists of an array of 4 VCSELs, mounted directly on a RF circuit board, and UV-curable polymer microlenses and waveguides which couple the laser output to a multimode fiber ribbon. Light from the lasers is captured by refractive polymer microlenses positioned on a **glass** substrate above the VCSEL array. The **lenses** focus the light signals onto angled reflective end facets in the polymer waveguides. These waveguides are situated on a sep. **glass** substrate which is **bonded** to the **lens** substrate. The light is then coupled from the waveguides to a multimode fiber ribbon; the average measured coupling **efficiency** was 47.5% ± 3%. Exptl. measurements reveal an analog bandwidth of 2.65 GHz per channel with better than 30 dB (elec.) isolation between adjacent channels for frequencies up to 2 GHz without active heatsinking. It was exptl. verified that this isolation is limited by the parasitics inherent in the VCSEL array rather than the parasitics of the device driver circuitry.

IT **Electrooptical** instruments
Lenses
Optical waveguides
(wideband four channel optical transmitter package using vertical cavity surface emitting laser arrays)

IT 7440-57-5, Gold, uses **24304-00-5,** Aluminum nitride
RL: DEV (Device component use); USES (Uses)
(wideband four channel optical transmitter package using vertical cavity surface emitting laser arrays)

IT **24304-00-5,** Aluminum nitride
RL: DEV (Device component use); USES (Uses)
(wideband four channel optical transmitter package using vertical cavity surface emitting laser arrays)

L27 ANSWER 16 OF 25 HCAPLUS COPYRIGHT 2004 ACS on STN
AN 1992:642441 HCAPLUS
TI High radiance indium gallium arsenide phosphide/indium phosphide **lensed LEDs** for optical communication systems at 1.3 μm
AU Hwang, C. K.; Wang, T. S.; Sung, C. P.; Hsu, S. H.; Chi, G. C.
SO MRL Bulletin of Research and Development (1992), 6(1), 45-8
CODEN: MBRDEZ; ISSN: 1010-2744
AB This study investigated the fabrication of high-radiance, InGaAsP/InP double heterostructure (DH) **light-emitting** diodes (**LEDs**) at 1.3 μm wavelength. The **LEDs**, with a small surface **light-emitting** region, are formed by alloying a metal film through a SiO2 insulating layer contact to the semiconductor surface. The **LEDs** with dielec.-isolation show good I-V characteristics and less leakage current than those with a Schottky barrier. A typical light output of 1 mW was obtained at 100 mA. A spherical microlens is **attached** to the InP substrate to improve the coupling **efficiency**. The peak coupled power of .apprx.40 μW was achieved at 100 mA for a 62.5 μm core multimode fiber.
IT **Electroluminescent** devices
(indium gallium arsenide phosphide/indium phosphide, **lensed**, for optical communication)
IT **22398-80-7**, Indium phosphide, uses
RL: USES (Uses)
(**LEDs** from gallium indium arsenide phosphide and, **lensed**, high radiance, for optical communication)
IT **12645-36-2**, Gallium indium arsenide phosphide
RL: USES (Uses)
(**LEDs** from indium phosphide and, **lensed**, high radiance, for optical communication)
IT **22398-80-7**, Indium phosphide, uses
RL: USES (Uses)
(**LEDs** from **gallium** indium arsenide phosphide and, **lensed**, high radiance, for optical communication)
IT **12645-36-2**, Gallium indium arsenide phosphide
RL: USES (Uses)
(**LEDs** from indium phosphide and, **lensed**, high radiance, for optical communication)
RN 12645-36-2 HCAPLUS
CN Gallium indium arsenide phosphide ((Ga,In)(As,P)) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
P	0 - 1	7723-14-0
In	0 - 1	7440-74-6
Ga	0 - 1	7440-55-3
As	0 - 1	7440-38-2

L27 ANSWER 17 OF 25 HCAPLUS COPYRIGHT 2004 ACS on STN
AN 1987:25551 HCAPLUS
TI Package for **light-emitting** devices
IN Miyake, Yoshio; Myake, Yoshio; Takei, Toshio
PA Mitsubishi Electric Corp., Japan

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 61145876	A2	19860703	JP 1984-267384	19841220
PRAI	JP 1984-267384		19841220		

AB In a package using a vessel consisting of a header and a cap for housing a **light-emitting** device and a **lens** for focusing the emitted light in a cap hole, a parallel plate is fixed to the cap between the **lens** and the **light-emitting** device, which may be a **LED**. A convex **lens** having a flat side facing the **light-emitting** device may be fixed in the cap hole. The **lens** and/or the parallel plate may be made of Si, GaAs, CdTe, ZnSe, KRS5, As_2S_3, or AgCl. Optionally, a **lens** which may be spherical is fixed in a disk in front of the cap. The package maintains a high **connection efficiency** with optical fibers by using a parallel plate from a high-n material. Thus, a claimed material transparent to light 1.2-1.5 μm in wavelength from a **light-emitting** device was used for the parallel plate, together with a Si **lens**.
IC ICM **H01L033-00**
IT **Electroluminescent** devices
(high-refractive-index **lenses** and optical parallel plates for)
IT **Lenses**
(high-refractive-index, for **light-emitting**-device packages)
IT **1303-00-0**, Gallium arsenide, uses and miscellaneous 1303-33-9 **1306-25-8**, uses and miscellaneous **1314-98-3**, uses and miscellaneous **1315-09-9 7440-21-3**, uses and miscellaneous 7783-90-6, uses and miscellaneous 76363-73-0, KRS5
RL: USES (Uses)
(**lenses** and parallel plates from, in **light-emitting** device packages)
IT **1303-00-0**, Gallium arsenide, uses and miscellaneous **1306-25-8**, uses and miscellaneous **1314-98-3**, uses and miscellaneous **1315-09-9 7440-21-3**, uses and miscellaneous
RL: USES (Uses)
(**lenses** and parallel plates from, in **light-emitting** device packages)
RN 1303-00-0 HCAPLUS
CN Gallium arsenide (GaAs) (8CI, 9CI) (CA INDEX NAME)
RN 1306-25-8 HCAPLUS
CN Cadmium telluride (CdTe) (9CI) (CA INDEX NAME)
RN 1314-98-3 HCAPLUS
CN Zinc sulfide (ZnS) (9CI) (CA INDEX NAME)
RN 1315-09-9 HCAPLUS
CN Zinc selenide (ZnSe) (9CI) (CA INDEX NAME)
RN 7440-21-3 HCAPLUS
CN Silicon (7CI, 8CI, 9CI) (CA INDEX NAME)

L27 ANSWER 18 OF 25 HCAPLUS COPYRIGHT 2004 ACS on STN
AN 1984:414863 HCAPLUS Full-text
DN 101:14863
TI Gallium indium arsenide phosphide/indium phosphide **LED** with improved productivity and output characteristics
PA Toshiba Corp., Japan
SO Jpn. Kokai Tokkyo Koho, 6 pp.
CODEN: JKXXAF

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 59004087	A2	19840110	JP 1982-111672	19820630
PRAI	JP 1982-111672		19820630		

AB A InGaAsP/InP **LED** was fabricated with improved productivity and output characteristics by applying FeCl3 etching with a resist mask so as to shape a light takeout surface into a very small **lens** when a surface **LED** in homojunction with InP or in heterojunction with InGaAs is prepared The take-out **efficiency** as well as the **connection efficiency** with optical fibers, is improved.

IC **H01L033-00**
CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
ST gallium indium arsenide phosphide **LED**
IT **Electroluminescent** devices
(gallium indium arsenide phosphide-indium phosphide, with improved productivity and output characteristics)
IT Indium phosphide (InP) **22398-80-7**, properties
RL: PRP (Properties)
(**LED** from gallium indium arsenide phosphide and, with improved productivity and output characteristics)
IT Indium arsenide (InAs) **1303-00-0D**, solid solns. with indium phosphide **1303- 11-3D**, solid solns. with gallium phosphide **12063-98-8D**, solid solns. with indium arsenide **22398-80-7D**, solid solns. with gallium arsenide
RL: DEV (Device component use); USES (Uses)
(**LED** from indium phosphide and, with improved productivity and output characteristics)
IT RN Indium phosphide **22398-80-7**, properties
RL: PRP (Properties)
(**LED** from gallium indium arsenide phosphide and, with improved productivity and output characteristics)
CN Indium phosphide (InP) (8CI, 9CI) (CA INDEX NAME)
IT Gallium arsenide (GaAs) **1303-00-0D**, solid solns. with indium phosphide **1303-11-3D**, solid solns. with gallium phosphide **12063-98-8D**, solid solns. with indium arsenide **22398-80-7D**, solid solns. with gallium arsenide
RL: DEV (Device component use); USES (Uses)
(**LED** from indium phosphide and, with improved productivity and output characteristics)

L27 ANSWER 19 OF 25 HCAPLUS COPYRIGHT 2004 ACS on STN
AN 1984:42763 HCAPLUS
TI Optical coupling in fiber optics packages with surface emitting **LED**'s
AU Berg, Howard M.; Shealy, David L.; Mitchell, Curtis M.; Stevenson, David W.; Lofgran, Lynn C.
SO IEEE Transactions on Components, Hybrids, and Manufacturing Technology (1983), CHMT-6(3), 334-42 CODEN: ITTEDR; ISSN: 0148-6411
AB The optical coupling performance of 2 fiber optics emitter packaging styles was determined into 5 large-core-diameter (≥100 μm) optical fibers with varying numerical apertures (NA). One package contains a short fiber coupled to a high index spherical **lens** positioned accurately between the **LED** and the fiber. The other package is fiberless, utilizing a high index **lens bonded** accurately to the **LED** using an alignment ring technique, and projects light through the package **glass** window to intercept the system fiber. Computer modeling studies were combined with the manufacture and anal. of actual packages to investigate the **optimum lens** parameters for both packaging styles. Exptl. and modeling studies suggest that for optical fibers with NA ≤ 0.20, the fiberless and short-fiber packages couple equivalent optical powers into fibers with diams. ≤200 μm. For larger diams., the fiberless package is somewhat superior. With high NA fibers (≥0.30), however, the short-fiber package is clearly superior for fiber diams. up to 200 μm, and equivalent for diams. >200 μm. The excellent performance of the fiberless package is achieved because the alignment ring technique provides not only the desired alignment accuracy, but also yields a reproducible **LED** -to-**lens** spacing.
IT **Electroluminescent** devices
(optical coupling in fiber optics packages with)
IT Gallium arsenide (GaAs) **1303-00-0**, properties
RL: PRP (Properties)
(**LED** from aluminum gallium arsenide and, optical coupling in fiber-optic packages with)
IT Gallium arsenide (GaAs) **1303-00-0D**, solid solns. with aluminum arsenide **22831-42-1D**, solid solns. with gallium arsenide
RL: DEV (Device component use); USES (Uses)
(**LED**, optical coupling in fiber-optic packages with)
IT Gallium arsenide (GaAs) **1303-00-0**, properties
RL: PRP (Properties)
(**LED** from aluminum gallium arsenide and, optical coupling in fiber-optic packages with)

L27 ANSWER 20 OF 25 HCAPLUS COPYRIGHT 2004 ACS on STN
AN 1982:572296 HCAPLUS
TI Optical coupling in fiber optics packages with surface emitting **LED**'s
AU Berg, Howard M.; Shealy, David L.; Mitchell, Curtis M.; Stevenson, David; Quill, Michael; Lofgran, Lynn
SO Proceedings - Electronic Components Conference (1982), 32nd, 111-19
CODEN: PECCA7; ISSN: 0569-5503
AB The optical coupling performance of 2 fiber optics emitter packaging styles is determined into 5 large core diameter (≥100 μm) optical fibers with varying numerical apertures (NA). The short fiber FOAC package contains a high n spherical **lens** positioned accurately between the **LED** and the optical fiber idnternal to the package. The fiberless package utilizes a high index **lens** **bonded** accurately to the **LED** using an alignment ring technique, and projects light through the package's **glass** window to intercept the system fiber. Computer modeling studies are combined with the manufacture and anal. of actual packages to investigate the **optimum** **lens** parameters of both packaging styles. Exptl. and modeling studies suggest that for optical fibers with NA's ≤.20, the fiberless and short fiber packages couple equivalent optical powers into fibers with diams. ≤200 μm. For larger diameter fibers, the fiberless package is somewhat superior. With high NA fibers (≥ .30), however, the short fiber package is clearly superior for fiber diams. up to 200 μm, and equivalent for fiber diams. >200 μm. The excellent performance of the fiberless package is achieved because the alignment ring technique provides not only the desired alignment accuracy, but also yields a reproducible **LED**-to-**lens** spacing.
IT Gallium arsenide **1303-00-0**, properties
RL: PRP (Properties)
(surface-emitting **light**-**emitting** diodes from aluminum gallium arsenide and, optical coupling from fiber optics packages with)
IT Aluminum arsenide **22831-42-1D**, solid solution with gallium arsenide
RL: USES (Uses)
(surface-emitting **light**-**emitting** diodes in gallium arsenide and, optical coupling in fiber optics packages with)
IT Gallium arsenide **1303-00-0D**, solid solns. with aluminum arsenide
RL: DEV (Device component use); USES (Uses)
(surface-emitting **light**-**emitting** diodes in gallium arsenide and, optical coupling in fiber optics packages with)
IT Gallium arsenide **1303-00-0**, properties
RL: PRP (Properties)
(surface-emitting **light**-**emitting** diodes from aluminum gallium arsenide and, optical coupling from fiber optics packages with)

L27 ANSWER 22 OF 25 HCAPLUS COPYRIGHT 2004 ACS on STN
AN 1980:596246
TI High-power aluminum gallium arsenide (AlxGa1-xAs) heteroepitaxial emitting diodes with multimesa structure
AU Zakgeim, A. L.; Marakhonov, V. M.; Pershina, L. P.; Seisyan, R. P.
SO Pis'ma v Zhurnal Tekhnicheskoi Fiziki (1980), 6(17), 1034-6
CODEN: PZTFDD; ISSN: 0320-0116
AB High **efficiency** and high radiative power are attained in diodes with multimesa structure. In such construction, a high value of the external quantum yield is realized by means of **optimal** dimensions of each sep. mesa, which provide conditions of multipassage and internal focusing of the generated radiation. A drop in the series resistance is attained by the parallel **connection** of many mesas united in a single crystal. The overall thickness of the AlAs-GaAs epitaxial structure is increased (110-130 μm), permitting the creation of deep mesa relief with subsequent removal of the substrate. There is a photoluminescent layer which reduces the absorption on the contacts located on the tops of the mesas. The active and photoluminescent regions both contain 10 mol % AlAs. Thus narrow spectral characteristics can be attained, with maximum at 810 nm, which guarantees the possibility of use for pumping YAG:Nd3+ lasers. The external quantum yield in air of diodes of area 1 mm2 with 25-30 sep. mesas is .apprx.10%, and the series resistance is 0.9-1.5 Ω. The use of an epoxy coating (EK-25A) with refractive index n = 1.55 increases the emitted power by a factor of 1.2, and the use of **hemispherical lenses** from chalcogenide **glass** (n = 2.2), by a factor of 2.4. A comparatively sharp drop in **efficiency** with increased current indicates the need for further reduction in the series resistance.
IT **Electroluminescent** devices
(aluminum gallium arsenide, multimesa structure for high-power high-**efficiency**)
IT **Glass**, nonoxide
RL: USES (Uses)
(chalcogenide, **lenses**, in **light-emitting** diodes for improved emission)
IT Coating materials
(epoxy, on **light-emitting** diodes for improved emission)
IT Group VIA elements
RL: USES (Uses)
(**glass** containing, in **lenses** for **light-emitting** diodes for improved emission)
IT **1303-00-0D**, solid solns. with aluminum arsenide
22831-42-1D, solid solns. with gallium arsenide
RL: USES (Uses)
(**light-emitting** diodes with multimesa structure, high-power high-**efficiency**)
IT **1303-00-0D**, solid solns. with aluminum arsenide
22831-42-1D, solid solns. with gallium arsenide
RL: USES (Uses)
(**light-emitting** diodes with multimesa structure, high-power high-**efficiency**)
RN 1303-00-0 HCAPLUS
CN Gallium arsenide (GaAs) (8CI, 9CI) (CA INDEX NAME)

RN 22831-42-1 HCAPLUS
CN Aluminum arsenide (AlAs) (6CI, 8CI, 9CI) (CA INDEX NAME)

L27 ANSWER 23 OF 25 HCAPLUS COPYRIGHT 2004 ACS on STN
AN 1980:416746 HCAPLUS
TI High-radiance aluminum gallium arsenide (AlGaAs) **LED** for fiber-optic communications
AU Shirahata, K.; Susaki, W.; Takamiya, S.; Horiuchi, S.
SO FOC, Fiber Optics & Communications Proceedings (1978), 1st, 92-5
CODEN: PFOCD9; ISSN: 0270-3025
AB A high-radiance AlGaAs **light-emitting** diode is described which has many excellent features for fiber-optic communications. It has a small, high-radiance **light emitting** area and a unique practical structure with a self-aligned spherical **lens** whose optical axis is automatically aligned with the center of the **light emitting** area. The typical radiance of 22 W/sr/cm2 for the area of 35 μm diameter was obtained at a low operating current of 50 mA. The micro-spherical **lens** of 100 μm diameter **attached** on the **light emitting** area of 35 μm diameter makes the half-power beam width of the radiation pattern narrow (typically 40°) and gives a coupling **efficiency** to optical fibers as high as theor. limit. For instance, the optical power into a fiber (core diameter : 150 μm, NA = 0.39) is >500 μW at 50 mA. The band width (optical power 1.5 decibel down) is typically 30 MHz, and as high as 100 MHz at the expense of quantum **efficiency**. The band width is almost independent of bias current. In spite of the high operating c.d. of 5 kA/cm2, there are no remarkable changes of the optical power in the life test of 104 h at room temperature The lifetime >106 h was estimated from the life test at high temps.
IT **Electroluminescent** devices
(high-radiance aluminum gallium arsenide, for fiber optic communications)
IT Gallium arsenide (GaAs) **1303-00-0**, uses and miscellaneous
RL: USES (Uses)
(**light-emitting** diodes from aluminum gallium arsenide **double** heterostructures with, for fiber optic communications)
IT Gallium arsenide (GaAs) **1303-00-0D**, solid solns. with
Aluminum arsenide (AlAs) **22831-42-1D**, solid solns. with gallium arsenide
RL: DEV (Device component use); USES (Uses)
(**light-emitting** diodes from gallium arsenide double heterostructures with, for fiber optic communications)
IT Gallium arsenide (GaAs) **1303-00-0**, uses and miscellaneous
RL: USES (Uses)
(**light-emitting** diodes from aluminum gallium arsenide double heterostructures with, for fiber optic communications)

L27 ANSWER 24 OF 25 HCAPLUS COPYRIGHT 2004 ACS on STN
AN 1979:584844 HCAPLUS Full-text
DN 91:184844
TI Gallium indium arsenide phosphide/indium phosphide fast, high-radiance, 1.05-1.3-μm wavelength **LED**'s with **efficient** **lens** coupling to small numerical aperture silica optical fibers
AU Goodfellow, Robert C.; Carter, Andrew C.; Griffith, Ifor; Bradley, R. R.
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AB Power levels up to 100 μW were launched from GaInAsP **LED**'s with 14-μm-diameter emitting regions into low-loss small numerical aperture (NA) silica fibers at a d.c. drive level of only 25 mA. A maximum launch power of 206 μW at 100-mA d.c. was obtained from slightly larger devices. The high coupling **efficiency** was achieved using truncated spheres of Ti2O3:SiO2 **glass** as microlenses. Gains over the butt coupled case exceeded a factor of 12 for the small-area devices. The high operating current ds. (2-20 kA/cm2) for the small-area devices resulted in modulation bandwidths extending to beyond 300 MHz (-3 decibel optical). The surface-emitting **LED**'s showed an enhanced performance over edge-emitting **LED**'s fabricated from similar material. Linewidths of the devices, which were prepared by liquid-phase epitaxy with step followed by ramp cooling, were approx. 3 kT. Even with the relatively broad linewidth, material dispersion limits in silica fibers exceeding 1 GHz·km around 1.3 μm are predicted. These devices are suitable for long-haul, wide-bandwidth fiber **links** operating in the 1.3-μm window.
IT Tin **7440-31-5,** properties 7440-66-6, properties
RL: PRP (Properties)
(Group IIIA metal pnictides-indium phosphide **LED** devices doped with)
IT Indium phosphide (InP) **22398-80-7,** properties
RL: PRP (Properties)
(**LED** devices from Group IIIA metal pnictides and, with **lens** coupling to silica optical fibers)
IT Gallium arsenide (GaAs) **1303-00-0D,** solid solns. with Group IIIA metal pnictides
1303-11-3D, solid solns. with Group IIIA metal pnictides
Indium phosphide (InP) **22398-80-7D,** solid solns. with Group IIIA metal pnictides
RL: DEV (Device component use); USES (Uses)
(**LED** devices from indium phosphide and, with **lens** coupling to silica optical fibers)
IT Gallium phosphide (GaP) **12063-98-8D,** solid solns. with Group IIIA metal pnictides
RL: PRP (Properties)
(**LED** devices from indium phosphide and, with **lens** coupling to silica optical fibers)
IT Gallium arsenide (GaAs) **1303-00-0D,** solid solns. with Group IIIA metal pnictides
1303-11-3D, solid solns. with Group IIIA metal pnictides
22398-80-7D, solid solns. with Group IIIA metal pnictides
RL: DEV (Device component use); USES (Uses)
(**LED** devices from indium phosphide and, with **lens** coupling to silica optical fibers)